EDDIE BERNICE JOHNSON, Texas
CHAIRWOMAN

FRANK D. LUCAS, Oklahoma
RANKING MEMBER

Congress of the United States
House of Representatives
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

2321 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515–6301
(202) 225–6375
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March 13, 2019

The Honorable Ajit Pai
Chairman
Federal Communications Commission
445 12th Street, SW
Washington, D.C., 20554

Dear Chairman Pai,

We are deeply concerned about the Federal Communication Commission's (FCC) plan to auction radio frequency spectrum on March 14 for 5G wireless communications. Given the frequency spectrum being considered, and at the FCC's suggested noise limit, there is the potential for signal interference with Earth observation sensors for weather and climate forecasting which operate at adjacent spectrum frequencies. This could pose a serious risk to the American public, and as such, the FCC should engage with the National Oceanic and Atmospheric Administration (NOAA), the National Aeronautics and Space Administration (NASA), and the Department of Defense (DOD) to ensure interference issues are adequately addressed before continuing with the spectrum auction.

NOAA, NASA, and DOD have used satellite-borne microwave sensors to measure water vapor since the 1970s.[1] Water vapor data is essential to the numerical weather prediction of rainfall and drought and helps increase the precision of such predictions. Water vapor measurements are also important in increasing accuracy of tracking hurricanes and monitoring sea ice, sea surface temperature, and soil moisture. Due to the specific properties of water vapor, it cannot be measured in frequency bands other than those currently allocated.

The water vapor channel is critical to weather sensing, monitoring, forecasting, and warning, and understanding climate patterns. Any interferences with this channel would therefore seriously impact public safety.

Meteorologists have expressed concerns for many years about radio frequency interference and losing access to specific portions of the electromagnetic spectrum they

[1] Views of the U.S. National Academy of Sciences and National Academy of Engineering on Agenda Items at Issue at the World Radiocommunication Conference 2012 (2013).

rely on for Earth observation. The Washington Post recently published an article on this very issue.[2] They obtained a February 28, 2019 letter from Commerce Secretary Wilbur Ross and NASA Administrator Jim Bridenstine to the FCC asked Chairman Ajit Pai to remove the FCC's published proposal from its website and to attend a March 11 interagency meeting at NASA headquarters "to continue the long-standing interagency reconciliation process on this important topic." The letter said the FCC posted the proposal when "there was no consensus in the interagency on this topic." It requested the FCC take down the proposal "immediately" ahead of a meeting convened by NASA "to continue the long-standing interagency reconciliation process on this important topic." Unfortunately, in a March 8 reply Chairman Pai rejected this request and stated his intention to move forward with the spectrum auction.

The American Meteorological Society has expressed concerns "over increasing pressure on weather-related radio frequency bands" and stressed the "need for adequate protection and mitigation efforts against the loss and shared use of the spectrum" for at least a decade.[3]

The FCC's announced plan for the 5G spectrum operating at the band of 24.25 to 25.25 GHz which is subject to the March 14 auction is to set a noise threshold of -20 dBW, as reported in a policy position submitted to a coordination committee of the World Radiocommunications Conference 2019.[4] There is great concern that the FCC's noise threshold will allow interference with weather and climate assets. A joint NOAA/NASA study to "determine the necessary out-of-band emission limit to allow co-existence" between International Mobile Telecommunications and passive sensors operating in the Earth exploration-satellite service, recommended a noise threshold of approximately -50 dBW to prevent interference with passive water vapor sensors. Because dBW is measured on a log scale, the difference between -50 and -20 dBW is significant. In fact, the U.S. National Academy of Sciences and National Academy of Engineering recommended a maximum interference level of -249 dBW/Hz within the 22.21-22.5 GHz band, in order to protect EESS satellite observations.[5] We would also note that the Europeans recently defined their noise threshold at -56 dBW.

We are concerned that the FCC appears to be dismissing the views and concerns of NASA, NOAA, the DOD, the National Academy of Sciences, and the international community in moving forward with the March 14 auction.

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[2] Jason Samenow, "Critical weather data threatened by FCC 'spectrum' proposal, Commerce Dept. and NASA say," Washington Post, (3/8/2019) accessed at: https://www.washingtonpost.com/weather/2019/03/08/critical-weather-data-threatened-by-fcc-spectrum-proposal-say-department-commerce-nasa/?utm_term=.852419060f72

[3] "Radio Frequency Allocations for Meteorological Operations and Research." A Policy Statement of the American Meteorological Society, Adopted by the AMC Council on 1 October 2009. https://www.ametsoc.org/ams/index.cfm/about-ams/ams-statements/statements-of-the-ams-in-force/radio-frequency-allocations-for-meteorological-operations-and-research/

[4] The -20 dBW threshold can be found in Table 1-1 in the document for download, entitled "usa_proposal_1.13_26_ghz.doc" at https://www.fcc.gov/us-contributions-sent-citel-pccii-0

[5] Id.

Our concern is not with 5G technology. We are strong supporters of advancing America's telecommunications infrastructure. However, advancements in telecommunications should not come at the expense of the safety and security of the American people. We are therefore asking for you to delay the auction of 5G spectrum until NOAA, NASA, and the DOD have been adequately consulted and their concerns have been addressed.

If you have any questions about this request, please feel free to contact Richard Obermann, Chief of Staff for the Committee at (202)225-6375.

Thank you for your attention to this matter.

Sincerely,

EDDIE BERNICE JOHNSON
Chairwoman
Committee on Science, Space,
and Technology

FRANK LUCAS
Ranking Member
Committee on Science, Space,
and Technology

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON

OFFICE OF
THE CHAIRMAN

April 29, 2019

The Honorable Eddie Bernice Johnson
Chairwoman
Committee on Science, Space and Technology
U.S. House of Representatives
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairwoman Johnson:

Thank you for your March 13 letter regarding the Commission's 24 GHz auction (Auction 102). I share the support you expressed in your letter for United States leadership in advancing 5G technology and deploying next-generation infrastructure. The auction of 24 GHz spectrum is critical to that leadership.

In that regard, Auction 102 began on March 14; the clock phase closed on April 17, with bids grossing nearly $2 billion, and the assignment phase will begin on May 3. This auction is making available 700 megahertz of spectrum in the 24.25-24.45 GHz and 24.75-25.25 GHz bands for commercial 5G services and applications.

These results come after years of full, fair, and open deliberation. The FCC proposed to open up the 24 GHz band for mobile terrestrial use in 2016. We adopted the service rules for the 24 GHz band two years ago, in 2017. In developing these rules, we followed the standard interagency coordination process. On April 26, 2018, in my written testimony before the House Appropriations Financial Services and General Government Subcommittee, I indicated that we planned to move ahead with auctioning the 24 GHz band soon. A few months later, on August 3, 2018, the Commission adopted the final procedures for Auction 102. In short, the service rules for the 24 GHz band and the procedures for Auction 102 have been public for a long time and were developed with interagency coordination (as well as through an open notice-and-comment process). Moreover, the Commission devoted substantial funds and staff resources to prepare for this auction.

Based on the record compiled by the Commission, the FCC concluded that these rules would protect the 23.6-24 GHz band from interference. The rules are consistent with previous Commission actions in the same range of spectrum. In 2000, for instance, the FCC established rules for operation in the 24.25-24.45 GHz and 25.05-25.25 GHz bands for a high-density fixed and point-to-multipoint wireless broadband service that was later auctioned in 2004 with the same out-of-band emission limits to protect passive services from harmful interference. Below 23.6 GHz, similar out-of-band emission limits were established to protect passive service operations from high-powered fixed service operations. Moreover, federal operations in the spectrum adjacent to the passive service allocation must comply with the same non-federal

protection limits, as adopted in the manual of the National Telecommunications and Information Administration.

In the nearly-two decades since these rules were adopted, including the past two years during which we specifically solicited input on emission limits for the 24 GHz band, we have not been presented with *any* evidence of harmful interference from these existing services nor a validated study suggesting that operations in accordance with these rules would adversely affect use of the 23.6-24 GHz allocation, including for weather forecasting. The Commission's decisions with respect to spectrum have been and will continue to be based on sound engineering rather than exaggerated and unverified last-minute assertions.

For these reasons, among others, I did not believe that the Commission should delay the March 14 auction just before it was to commence. Such a delay would not have been fair to those bidders that had prepared to participate in the auction. Such a delay would have sent a message that the United States was not fully committed to leading the world in 5G. And most important, such a delay would have been unjustified.

Again, thank you for expressing your concerns in this matter. Please let me know if I can be of further assistance.

Sincerely,

Ajit V. Pai

FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON

OFFICE OF
THE CHAIRMAN

April 29, 2019

The Honorable Frank D. Lucas
Ranking Member
Committee on Science, Space and Technology
U.S. House of Representatives
2321 Rayburn House Office Building
Washington, DC 20515

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